THE COMMONWEALTH OF MASSACHUSETTS

DEPARTMENT OF PUBLIC UTILITIES

June 12, 1973

D.P.U. 17490

Investigation by the Department upon its own motion as to the adequacy of the telephone service and facilities available to the subscribers of New England Telephone and Telegraph Company in its service area within the Commonwealth.

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INTRODUCTION:

This proceeding was instituted by order to show cause, issued by this Department to the New England Telephone and Telegraph Company (hereinafter "Company" or "NET"), on September 25, 1972, directing NET to appear and show cause why the Department of Public Utilities should not adopt a Proposed Service Order. This proposed order pertains to telephone service and facilities available to subscribers of the Company in its service area within the Commonwealth.

The order to show cause set forth that a public hearing would be held on the following dates and at the locations indicated below:

DATE		LOCATION
November 1, 1972	Pittsfield	- Auditorium, Central Annex, Second Street, Pittsfield.
November 2, 1972	Springfield	- Mahogany Room, Springfield Auditorium, Springfield.
November 8, 1972	Worcester	- G. A. R. Hall, 55 Pearl Street, Worcester.
November 15, 1972	Lowell	- City Council Chamber, City Hall, Lowell.
December 6, 1972	Brockton	- City Council Chamber, City Hall, Brockton.
December 13, 1972	Hyannis	- Middle School, High School Road, Hyannis.
January 10, 1973	Boston	- Gardner Auditorium, State House, Boston.

The Department issued a second order to show cause on October 24, 1972. In this order, which was essentially identical to the order issued on September 25, 1972, the Department notified the Company that additional public hearings would be held relative to the Proposed Service Order in the Newton City Hall, Newton on November 16, 1972.

The hearing schedule set forth above was met. In addition, further hearings were held in Newton on November 27 and 28, 1972 and in Boston on January 11, 12, 15 and February 21, and 22, 1973.

The public was given due notice concerning all of these hearings. Approximately 15 public officials and 85 members of the public testified at the various hearings. Three employees of Arthur D. Little, Inc. and 5 officials of the Company testified.

This proceeding was held pursuant to the provisions of Chapter 159 of the Massachusetts General Laws, Section 16. This proceeding is also an adjudicatory proceeding as defined in Chapter 30A of the Massachusetts General Laws, Section 1 (1).

Chapter 159, Section 16 grants statutory authority to this Department to examine the "regulations, practices, equipment, appliances or service of any common carrier "-- including any company engaged in the transmission of intelligence by electricity. This statute further provides that, in the event that the Department finds that such regulations, practices, etc. are "unjust, unreasonable, unsafe, improper or inadequate,...(it) shall determine the just, reasonable, safe, adequate and proper regulations and practices thereafter to be in force and to be observed, and the equipment, appliances and service thereafter to be used, and shall fix and prescribe the same by order..."

Background of Proceedings:

The Department issued its Proposed Service Order on September 25, 1972. It was based upon the findings and recommendations compiled by the Department's consultant, Arthur D. Little, Inc. (ADL). That report, entitled "Technical Analysis of the Massachusetts Area of New England Telephone and Telegraph Company", was the result of an exhaustive eight month investigation conducted by ADL regarding the operation of the Company. The report, dated September 1, 1972, underscored numerous central office, maintenance, forecasting and trunking inadequacies which were especially pronounced in the greater Metropolitan Boston area.

The ADL study was authorized by the Department on January 1, 1972. Its purposes were: (1) To evaluate the appropriateness of the standards against which telephone service levels are measured. (2) To analyze the then prevailing service levels in relation to these standards. And (3) To develop a system of measurement which will better allow the Department to monitor telephone service in the future. ADL had complete access to NET's personnel, facilities, and records in Massachusetts, and acknowledged that complete cooperation was extended by top NET management in this respect.

ADL reported that the Company had created a number of varied plans, organizations, and systems during 1971 and 1972. ADL indicated that many of these corrective programs had a significant effect in offsetting what were previously clear downward performance trends in important customer service affecting areas. ADL also concluded, that on a "self-comparison basis" (i.e. month to month, month this year to same month last year etc.), the NET (Bell) measurements are valid indicators of trends in the operation of the business. Our consultant sounded a note of caution, however, in stating that these internal indices measure

overall service performance, and not the quality of the individual planning, designing, engineering, and installing functions.

The ADL study emphasized the importance of the planning function in effectively guiding the expansion of the existing system. ADL also extensively explored those aspects of the designing, engineering, installing, monitoring and maintenance functions that provided the best approach for an analytical determination of NET's capability and capacity to fulfill these functions. This was done with a view to insuring that the monies that the Company collects for service are reflected in adequate levels of performance.

It is noteworthy that ADL commented on the apparent "paradox" between the improvements in the NET customer service indices which their study revealed, and the sustained level of customer complaints received by the Department during the period of the study. ADL suggested that one possible answer to this relevant inconsistency is the fact that telephone equipment alone is not the sole determinant of customer service. A very significant factor is employee productivity. This, ADL noted, is a function of numerous factors. Among the most important factors are training, experience, turnover, motivation, attitudes, work planning and scheduling, and the relations of field and office personnel with customers.

AN OVERVIEW OF THE TELEPHONE SYSTEM:

The operation of the telephone business in Massachusetts by NET involves the design, construction, operation, and maintenance of a large and technically complex system of interacting equipment and functions. The Company serves two million customers in the Commonwealth. There has, in recent years, been a sharp increase in the length of the average call. The length of calls, as well as the number of calls, affect the amount of switching and trunk plant required of the Company. The Company's plant investment in Massachusetts, net of depreciation, has risen to approximately 2.3 billion dollars. During 1972, NET's construction expenditures were approximately 360 million dollars. Projected expenditures for 1973 are 390 million dollars.

NET employs, in addition to its corporate headquarters' staff, about 29,000 persons in Massachusetts. This represents an increase of about 45% since 1965. The Company's Massachusetts operations are divided into five divisions. The divisions, in turn, are divided into districts which are further subdivided into exchanges.

NET's Massachusetts area is also divided functionally into departments, principal among them being plant, outside plant, switching, network, operator services, engineering, commercial and accounting.

NET SYSTEM DESIGN:

The Company designs its equipment with a view to meeting the demands of peak calling periods, i.e., during the busy hour of the busy season (typically January through March) when demand is likely to be greatest. Every

telephone is connected to a central switching office by means of a pair of wires over which conversations pass. The wires from each telephone are carried by cables to the central office. As many as 2700 pairs may be contained within one cable. Main feeder cables extend outward from the central office throughout the exchange. Smaller cable pairs branch out from it to provide lines down side streets. The latter are known as distribution cables.

There are 266 central offices in Massachusetts, containing approximately 300 switching entities. The central office contains switching equipment that processes telephone calls and connects one customer's line to another. A subscriber uses his telephone set to transmit impulses to a central office. These signals control a set of switches that connect a call to another party in the same exchange, or to a trunk and then to another central office which then connects the call to the recipient. The switching system also provides dial tone, ringing signals, and all audible and supervisory signals.

There are several different types of switching machines found in central offices. They vary in size and capacity. The type utilized in a given area depends upon the characteristics of the area served. The two basic types are common control and direct control. The common control entities include panel, number 1 and number 5 crossbar, and ESS (electronic switching system). The direct control entity is known as a step-by-step.

In the case of common control equipment, the same equipment performs certain functions for many customers. Practically all switching entities within the Route 128 perimeter are common control. All calls pass through the local switching entity. A call outside of a switching entity

will pass over a trunk, or talking path, to the other central office or through intermediate switching entities known as tandems. Some switching entities are large and complex and can process as many as 85,000 calls an hour. Depending upon how far a call is going, and the routing alternatives, a call may switch through as many as nine machines, each connected by trunks. A fundamental aspect of system design provides alternate routes for a call. Thus, if one route is blocked, or busy, a call may still go through via an alternate route.

Trunks may consist of hard-wired copper pairs or carrier facilities. Carrier facilities essentially "piggyback" one voice conversation on top of another, permitting multiple conversations over the same pair of wires at the same time. This is accomplished through the use of modulators which convert voices from one frequency range to another. Individual trunks are organized into trunk groups, of which there are two classifications. Trunk groups which have a back-up, alternate route, should all trunks in the group be busy, are known as high usage trunk groups. Those for which there are no subsequent alternate routes are known as final groups. Trunk groups can vary in size from as few as two to over 100.

Telephone system design is based upon certain probabilities. Economic considerations render it impracticable to provide facilities in such a quantity to offer everyone, at all times, a quality of service that is without blockage or delay. A very minimal percentage of calls will, under given circumstances, be blocked or delayed. The Company designs its equipment so that 98.5% of all call attempts will receive dial tone within 3 seconds during the busy hour of the average business day in the busy season. Trunks are designed so that no more than 1% of all calls during the busy hour of the busy season will encounter a no-circuit condition. NET engineers its tandem

facilities to provide for the attachment of senders (key devices essential to the processing of calls through tandems) within 3 seconds in 99.5% of all cases.

PLANNING AND ENGINEERING

Telephone planning is done many years in advance and is based upon forecasts of growth and usage. High growth industrial urban areas, like some areas within Route 128 are complex to design because of the large number of switching machines necessary, because of greater and more complicated usage of the system, and because of the more complicated trunk arrangements necessary to serve it. Mobility of population and industry affect usage.

Forecasting telephone plant and usage requirements is done at several levels within the Company. The General Planning Forecast looks ahead 20 years, and projects the amount and types of telephones that will be needed. (e.g. residence vs. business). The outside plant forecast seeks to project where, in a given community, such additions will appear. Usage forecasting addresses itself to the calling habits of customers (i.e., where and when they are likely to call), and also projects the holding time of the average call. The General Planning Forecast is performed by a group within NET which follows a system known as the Exchange Analysis Program, adopted in Massachusetts in 1970. The data collated in this Program are compiled and submitted to the central forecasting group. It is also necessary for NET to predict the holding time of the average telephone call. This holding time is known as "hundred call seconds per main station", or CCS/MS.

The Company also prepares an Administrative View which projects telephone growth on a state wide basis. This supplements the General Planning Forecast. Like other businesses, NET is subject to the vagaries of the

economy. These factors can have adverse effects on forecasts and NET seeks to adjust for such uncontrolled variables. A prolonged strike in 1968 seriously affected the Company's ability to engineer and construct additions to switching entities and trunk plant. As a result of the strike, the additions for the 1969 busy season could not be completed on time. Unfortunately, the 1968 strike coincided with a period of pronounced increase in demand, and contributed to certain difficulties encountered into the early 1970's.

Flexibility is an absolute requirement for managing a telephone system, particularly in a period of rapid change.

COTIMAS (Central Office Totally Integrated Management System) provides a methodology for insuring that a central office growth job is delivered within its time schedule. Under COTIMAS, representatives of the Equipment Installation, Switching, and Plant Extension departments meet weekly with the chief engineer of Massachusetts to discuss the installation intervals for equipment required to be on line to meet projected growth. This group seeks to obtain equipment and thereby meet scheduled "on line" dates by often disregarding normal operational procedures. If equipment is not installed on time, the group identifies the responsible parties and districts.

To provide analysis for the planning, utilization and maintenance of outside plant, NET has conceived a computer system known as OPTIMAS (Outside Plant Totally Integrated Management System). It is being adopted across the state and permits reliable forecasting. Part of OPTIMAS is a computer module known as CAFAN, which indicates the number of available pairs at any given place along a cable route. CAFAN helps to make effective use of present exchange facilities, and will be fully implemented within the state in the next few months under present plans. All the information which

would be provided by exchange cable facilities charts is available through the CAFAN technique. In addition, since CAFAN contains the information concerning availability of pairs by section, it provides more information in a more useful way.

The construction budget, which is reviewed several times a year, is submitted annually by the Company to the Department. It contains all the Company's construction plans for a two-year period. This includes outside plant, as well as central office, tandem and network jobs. Details are provided for projects which would cost more than $10,000, and are listed by exchange, class of plant, service date for additions, capital expenditures, and a brief description of each construction project.

CENTRAL OFFICE SWITCHING AND CUSTOMER SERVICE

NET utilizes a number of performance indices to measure the adequacy of central office equipment. A given index may be a composite of many component indices which are derived from measurements of actual performance. The Company seeks to attain a rating of 96-98 in its indices, which are important and meaningful to those within the business who use them on a daily basis. In order to provide an accurate understanding of what is happening in any service area, an index must be translated into the raw data of its various components.

Trends are more significant than data for a given month, inasmuch as results are susceptible to periodic aberrations. It is the long range performance of the system which is most important. Hence, trends in service measurements are one of the most effective ways of judging the administration of the telephone system in an area.

As a result of a very substantial number of programs and new plans, the trouble report rate has declined during the last seven months. Four of

the five divisions in the state are currently showing a greatly reduced trouble report rate compared to 1971. Trouble report rate trends are more important than monthly figures. For example, a district could be trending in an undesirable direction and require analysis, and yet be within desired levels. In like manner, unusual results can occur in any month because of an unexpected occurrence, such as a storm, and yet not be cause for serious concern.

OBSERVATIONS REGARDING SOME RECENT IMPROVEMENTS

Certain salient observations should be made regarding some improvements in service that have begun to be reflected in the various reports which are filed with the Commission on a periodic basis. Previous trends which were of particular concern to us, such as dial tone delays, overloaded trunk lines and incompleted or disconnected calls have shown distinct improvements principally because of the installation of three so-called "4A" tandem switching machines. Two of these are in Boston and one is in Springfield. Each such "4A" installation has the capacity to handle in the order of 100,000 "busy hour" or peak usage period calls. The Company's 1973 construction budget reveals that "4A" tandems are being built in Kendall Square, Cambridge (at a cost of $65,000,000), and in Lawrence (at a cost of $35,000,000 for this phase of construction and operation with provisions for future expansion).

The Kendall Square "4A" tandem became operative on June 2, 1973. In addition, two conventional tandem facilities were also added in Boston and Framingham respectively. As Mr. Norris. explained in his testimony of February 22, 1973, which we analyze in greater detail below, numerous "trunk rearrangements" have been effected in the Boston Metropolitan Area during the past three years. Some of these were a result of the newly built tandem offices.

In the final analysis, both tandem construction and trunk rearrangement have provided significantly more flexible routing for calls, thus improving service in given areas.

In passing, we note that trunk installation is aimed at achieving an objective 1% blockage rate as determined in the Poisson Probability Tables. This is an acceptable standard when analyzed with the

infinitesimally high costs that would accrue if an "ideal" or "perfect" (i.e. zero blockage rate) were ever established as an objective. Our consultants understood this, as has this Department for many years. ADL described such a standard as "gold plated". A zero blockage rate, though doubtful of attainment in practical engineering terms, would, without question, require hundreds of millions of dollars (if not billons) in new central office, tandem and outside plant equipment. It would produce a predictable monumental increase in all telephone rates. This would not be in the consumer's interest.

COMPANY MATHEMATICAL INDICES

NET has used a number of Bell System indices which are employed to measure such matters a (1) dial tone speed, (2) speed of operator response, (3) frequency of incompleted calls, (4) trunk line overload, (5) installation of plant (i.e. phones in residences or business establishments) and (6) trouble report trends. This list is not meant to be comprehensive, but rather representative of certain functions that are under constant scrutiny by the Company. It is noteworthy that where applicable, samplings for these indices are taken during periods of "peak usage", the latter having been also established on the basis of actual historical experience and mathematical models.

The indices presently in use have, in a statistical sense, been found to be both valid and reliable. To be sure, a statistical technique can, and very often does, have built in limitations.

Similarly, statistical methods are in large measure dependent upon the raw data which they utilize as well as the manner in which this data may be collated. In truth, therefore, the accuracy of a given statistical methodology rests not only upon the formula or formulas used in a specific index. Standing alone, a statistical method may be empirically accurate, but the reliability of an index also rests largely on such factors as the scope of a specific sampling method, as well as whatever judgmental elements might enter into the evaluation of the raw data thus assembled before it is used in any formula. We consider these to be elemental statistical principles. Many of these concepts were discussed in the ADL study and during the direct examination of the ADL experts. It cannot be overemphasized however, that statistics can, and sometimes do, mislead.

In making these observations, we do not mean to imply that bad faith has been exercised by the Company in compiling its indices. There is no evidence in the record upon which to predicate such a serious charge. Our purpose in alluding to the Company indices and statistical methods is primarily to lend emphasis to their importance, particularly as they relate to customer attitudes and growth forecasting. These areas are critical. We urge the Company to regularly scrutinize its mathematical models and formulas to insure not only their validity, but their reliability component as well. If the NIT resources and staff prove inadequate to complete this review, we strongly suggest that AT&T mathematical and computer specialists be brought to Massachusetts to accomplish this review.

ACTION TAKEN BY NET TO IMPROVE ADEQUACY OF SERVICE

A representative of the Company's Switching Systems Department testified that "facilities charts" are kept to maintain a constant review of central office performance. They are used to project increases in main telephones and usage of these phones. When asked whether the Company anticipated capacity shortages in 1973, he responded that there would be "no capacity shortages that would have any effect on service." The Company's peak season, (with the exception of Cape Cod) occurs during the months of January, February and March.

NET, in 1969, formed a "Potential Service Problem Committee." The record indicates that there are presently no capacity shortages which have been identified by this Committee. This Committee collects data relating to customer usage and service, and seeks to isolate what are technically known as "weak spots". A "weak spot", although in itself not necessarily an indicator of an equipment shortage, serves to underscore a need to add or rearrange central office equipment. It does not identify maintenance problems, the latter being covered by other indices of performance. The ADL report indicated that in January of 1971, there were in the order of 25 to 30 potential service problems. In January of 1972 the number of potential service problems had been reduced to approximately 6. As of February 21, 1973 there were no potential service problems. While a given central office may have no potential service problem from a capacity standpoint, it may still encounter equipment malfunctions or maintenance problems due to excessive rain or freezing rain conditions, for example.

In recent years, NET has spent the following amounts for central office equipment only: In 1970 - $80 million; 1971 - approximately $90 million 1972 - slightly over $150 million, in 1973 - expenditures in excess of $160 million are projected; and in 1974, it is anticipated that in excess of $170 million will be spent for central office equipment.

During the course of the February 21, 1973 hearing, considerable time was spent discussing the constituent components of the Dial Line Index. This index is composed of 5 different components as follows: (1) Dial tone speed; (2) No circuit (also known as an "overflow", a "fast busy" or "reorder"); (3) equipment irregularity; (4) incoming matching loss and (5) customer dialing irregularities. The Dial Line Index measures calls out of a central office and covers a 25 mile radius. This index is the principal measure of central office performance. The overall NET Dial Line Index objective, as is the case with other Company indices, is 96 to 97. This was found to be adequate by ADL.

For the entire Commonwealth of Massachusetts for January of 1973, the Dial Line Index was 97. Using an index of 100, dial tone speed for this period was 100. Stated differently, 99.4% of the customers were receiving dial tone within 3 seconds, and .6% were not getting a dial tone within 3 seconds. With regard to the circuit availability component ("fast busy", "reorder" or "overflow") .9% of all calls met an overflow response. Thus, in January of 1973 the no circuit or overflow statistics revealed that 99.1% of the calls being made in the Commonwealth were not encountering trunk line problems. The ADL study indicated that this was within acceptable limits.

In January of 1973 the equipment irregularity component stood at .4% meaning that 99.6% of all calls met no equipment malfunctions. We will limit our discussion of the Dial Line Index to the 3 above-mentioned components.

Without seeking to explain in detail the steps involved in converting the absolute Dial Line Index figures, it will suffice for our purposes to state that an absolute reading on an index of 100 can be converted to a percentage value. The percentage value, in turn, may be translated into Bell System index points. A 96 value on the index is convertible to .8%, a 94 equals 1%, and 88 equals 1.3%. We generally agree with the statement that percentage figures are more meaningful to the general consuming public than the internal Bell System values.

In January of 1973 the Bowdoin District and the Back Bay District registered respectively 87 and 90 values on the Dial Line Index. For the same period, the Newton Dial Line Index stood at 98, a satisfactory performance level. The Bowdoin 87 reading is attributed to 1.1% equipment irregularities and 1.6% "overflow" or "no circuit". (The telephone user generally recognizes this situation by hearing a "fast busy signal"). NET traces these problems to the fact that the Bowdoin and Back Bay Central Offices still use "panel common control equipment". The Back Bay Central Office panel equipment was replaced by ESS (electronic switching system) equipment on June 2, 1973. No such panel equipment will be used in the Commonwealth by June of 1975 under present Company construction schedules.

The panel equipment, to which can be traced a significant number of consumer complaints which are reflected in the Company indices, are generally being replaced by ESS equipment. Briefly stated, ESS is very modern computer controlled switching equipment which is being installed in numerous central offices. It is far superior, in terms of performance, reliability, maintenance and capacity than the old panel equipment, and, most importantly, provides much greater trunking flexibility. It is consequently anticipated that the Bowdoin and Back Bay central offices will show performance indices which will be markedly improved by the end of the second quarter of 1973. We intend to exercise extraordinary attention to the proposed "on line" date which is projected for the very important Bowdoin central office.

Company Exhibits "F" and "H" indicate that "weak spot" statistics are compiled with data which is collated over 3 to 4 month periods. The principal function of these weak spot statistics is to indicate trends. In December, 1972, 34 weak spots were reported in the Commonwealth, 25 being overflows, 7 in the equipment irregularity category, and 2 in dial tone delays. Yet, in December of 1972 there was an equipment malfunction in Wellesley the repair of which had an adverse effect on dial tone speed for two days during peak usage periods. By way of contrast, the ADL report revealed that in March of 1972, 60 weak spots existed, broken down by categories as follows: 11 equipment irregularities, 31 overflows; 13 dial tone delays; and 5 incoming matching loss.

In January of 1973 there were no dial tone delays, although there were indications of 33 state wide weak spots, 9 of which were equipment irregularities and 24 of which were equipment overflows. The Company attributed the decrease of one in overflow weak spots to improved trunking conditions, and its belief that improved maintenance programs now in use in all central offices has contributed to a generally favorable trend indicating a reduction in equipment irregularity weak spots.

We shall not undertake to set forth in detail the elements of the NET maintenance programs. This would duplicate much of the ADL study and some of the testimony. A selected number should, however, be enumerated in view of the fact that considerable testimony was offered to explain their functions. Thus, the "Controlled Maintenance Plan" makes use of automatic testing equipment, implements scheduled routines or maintenance operations, and checks the timeliness of project work in accordance with construction schedules.

A "No. 5 Crossbar Service Improvement Committee" has been formed to periodically review maintenance procedures for this equipment. Western Electric, American Telephone and Telegraph, Bell Laboratories and NET personnel participate in these review sessions.

A "Technical Assistance Center" has been established in Massachusetts to quickly solve any ESS equipment problems that may arise.

A "Method of Procedure Program" has established rules and practices for adding new equipment in central offices. The purpose of this program is to minimize the effect of central office work on the telephone user. "Service Control Meetings" are now also regularly held to maintain optimal operational standards within central offices.

NET's "Operator Services Department" (called the Traffic Department by ADL), performance level is measured in areas involving such matters as the percentage of operator calls that require more than 10 seconds for an operator response. In January of 1973, the Bell System objective of 96 was met throughout the Commonwealth. An index value of 96 means that 10.1-11.1% of all operator calls were not being answered within 10 seconds. A 94 reading would equate to 12.3-13.2%.

Without listing all central office improvements recently achieved, the following are particularly significant: The City of Quincy no longer has a central office capacity problem. This has come about because ESS was put into effect there in September of 1972. The Quincy Dial Line Index is above 96. In Weymouth, a second "5 Cross-Bar Marker Group" was added in 1972. Previous capacity problems in Plymouth, Carver, Canton, Dedham, Ipswich, Lawrence, Lowell, Revere and East Boston have been solved and their corresponding performance indices are much improved. Capacity problems in Randolph were scheduled for clearance in February of 1973. Since the installation of ESS in Melrose in July of 1971, performance index readings have improved significantly and are generally acceptable. Somerville and Newton no longer have capacity or dial tone problems. Service in Cambridge, Holyoke and Springfield is now reported as being without capacity problems and with acceptable dial line performance values.

In January of 1973 an overflow weak spot appeared in the Brookline panel unit. Brookline had no switching capacity problem during that month. We urge NET to pay particular attention to this central office. The Department will study the performance indices for Brookline very carefully.

The Company offered testimony regarding the activities of the Plant Department, within which is included the equipment in a customer's home or business. The Company measures its ability to install or add requested equipment and compiles the corresponding installation service results in index form. Fundamentally, the data thus accumulated are addressed to two distinct items: (1) Can NET comply with a customer request? and (2) Did NET meet a scheduled appointment? In the fourth quarter of 1972 approximately 96% of installation requests were met, and in January of 1973, 97% were met. With regard to appointments met, NET met its commitments 95% of the time for the fourth quarter of 1972, and this percentage remained the same for January of 1973. The Company installed regular telephone service within 5 days from date of an order 86% of the time in January 1973. In 10-11% of the cases, appointments were missed for customer reasons, the corresponding 3-4% being NET's fault. From a Bell System index standpoint, installation service has improved from a factor of 94 in 1969 and 1970 to a factor in excess of 96 (the "objective level") in 1972.

The Plant Department's installation repair force has been increased in excess of 20% during the period 1969-1972. The Outside Plant Work force has also been increased by 20%. Installation repair force employees were given 180,000 hours of craft training in 1972 compared to 130,000 hours in 1969. The ratio of supervisory to non-supervisory employees is now 1 to 6.4. A completed service order is now put through a "mini test" at the central office. In this manner, a test man double checks the reliability of the installer's work. This procedure is now two years old.

The ADL report and Company testimony revealed in detail the established NET procedure that is used to process and resolve a "trouble report". The sequence, from the log on a McBee Ticket to a Disposition Code was thoroughly explained. We find this procedure adequate at this time.

The problem of construction site "digups" remains serious. Construction companies often cut telephone cables because they fail to establish their location before beginning a job. NET is attempting to resolve this by distributing stickers to be affixed in the cabs of bulldozers and trenching machinery. Operators of these machines are now urged to call a toll free number before commencing work at a site. NET and other utilities are exchanging information regarding construction projects. Some progress has been made in reducing vandalism to public telephones. The newer phones are now affixed with stronger bolts, are made of steel, and have armored cords.

Considerable evidence was introduced regarding the problems encountered in compiling and interpreting trouble reports. NET contends that ADL's recommendation (that only trouble reports in excess of 8.66 per 100 stations be reported) would be insufficient. A Company witness expressed a preference for including trouble reports on a monthly basis for every district in the Commonwealth, in order that any adverse trends may become evident.

In January of 1973 there were four districts that exceeded the ADL 8.66 criterion. These were: (1) Back Bay; (2) Bowdoin; (3) Brookline; and (4) Harrison. It is particularly noteworthy that each of these central offices still contained old panel equipment at that time. The Back Bay central office now has ESS equipment in operation. The equipment in the other central offices is scheduled to be replaced by ESS equipment. The trouble report rates in these central offices, while slightly declining, convince us that NET's

manpower should be concentrated in these offices to reduce the trouble report rate until ESS is installed. In the Bowdoin central office, the trouble report rate in November, 1972 was 12.8; in December, 1972 - 13.2; in January, 1973 - 10.5. In the Back Bay central office, the November, 1972, rate was 12.7; in December, 1972 - 12.1; in January, 1973 - 11.1. In Brookline, the November, 1972 rate was 10.58; December, 1972 - 10.98; and Janury, 1973 - 8.67.

NET's Chief Engineer for Massachusetts, testified relating to the different types of Company forecasts, the manner in which they are compiled, and the role that the forecasts play in the formulation of short and long-term planning.

His chief responsibility centers about the development and control of the Company's construction budget for the entire state. His duties are clearly extensive. In 1965 there were 2.8 million telephone stations in service, and some 14 million calls per day were being made. In 1972, 3.7 million phones were in service and approximately 20 million calls per day were being completed. In the period 1965-1972 toll messages almost doubled by from 700,000 to 1.3 million per day. In this same period the construction budget increased from 125 million dollars per year to 360 million dollars per year. The number of Company employees increased from slightly over 20,000 in 1965 to almost 29,000 in 1972.

Forecasting is done by groups located in the 5 state divisions. There are three basic types of forecasts. These project (1) new demand for service; (2) future usage of installed telephones; and (3) the number of trunks needed to carry messages between central offices. The first category of forecasting new demand for service falls within the purview of the General Planning Forecast. It is compiled by the participation of various forecasting groups located in given cities and towns of each of the state's five divisions.

The data produced by the General Planning Forecast is given to the Switching Systems Design Division. The designers within this division analyze these data in relation to the hundred call seconds per main station (CCS/MS) information, as well as with certain historical data which they maintain. This statistical information forms the basis upon which is founded the decision to build a central office addition. The latter is intended generally to meet demand normally for two busy seasons after the completion of the addition.

This rule, however, is not inflexible. Circumstances often require that central office capacity be provided in either smaller or larger increments than the two year increment.

The Switching Systems Department provides essential data to the Plant Extension Engineer. This engineer estimates the costs of an extension project and establishes a construction schedule. Proper scheduling of central office extensions is a very important function. When properly done, equipment installation and transitions (i.e. "tie-ins") of preexisting equipment to new equipment in a central office can be accomplished during periods of time that do not conflict with the busy season. Therefore, customer inconvenience can be held to an absolute minimum under a carefully planned and followed schedule.

In connection with central office extension scheduling a recently conceived plan, to which reference has previously been made, and known as COTIMAS (Central Office Total Integrated Management Administrative System) has been created. Its purpose is to call higher management attention to a central office addition project that may be falling behind schedule. The COTIMAS group's responsibility is to take all steps to expedite a construction job as originally planned. As of December of 1972, 83% of 210 central office construction jobs were completed on schedule. Of those not completed on time, two were deemed to have had a probable impact on service.

The Company has also developed a Method of Procedure (MOP) plan by which a new installation is carefully coordinated between engineering and switching systems (network) forces. The purpose of this plan is again to eliminate service affecting "tie-ins" of new equipment.

Trunk forecasting, clearly another key planning function, falls within the province of the Network Department. This Department is responsible for the design, administration and maintenance of tandem and toll trunk switching machines. It is also responsible for the development of trunks necessary to tie all switching machines together.

The Administrative Forecast is conducted in each of the state's five divisions. This forecast may be described as a "top down look" at growth

patterns that may be anticipated in terms of (1) main telephone growth; (2) extension telephones; (3) lines; (4) regrades (e.g. change from two to one party service); and (5) inward movement.

As we have previously noted, many trunk additions and rearrangements have been effected during the past two years. The record of these proceedings reveals that 687 trunks were required to bring trunk groups that exceeded the Poisson (PO)-3 level down to PO-1 (the "objective level"). Of the trunk groups that were reported to be between PO-1 and PO-3, 283 trunks were needed to achieve the objective performance level.

There are two trunk groups that have not been brought to PO-1 standards. One is in the Bowdoin (Boston) central office and connects with the Traffic Service Position System (TSPS). TSPS, installed in Boston and Framingham in 1970 and 1971 respectively, enables customers to dial their own person to person and credit card calls. The Bowdoin office needs four such trunks, the installation of which has been postponed until after the August 1973 scheduled replacement of the Bowdoin panel equipment by ESS equipment.

The other trunk group that is not yet at PO-1 level is located at the Back Bay (Boston) central office. This central office was scheduled to have its old panel equipment replaced by ESS equipment in June of 1973. As previously noted, the Back Bay ESS equipment became operative on June 2, 1973. Four TSPS trunks are also needed at this central office.

Our consultant has testified that when a new central office machine such as ESS equipment, becomes operative, or is ("cut over"), it is not extraordinary for the Company to encounter transitional problems of sometimes 4 to 6 months duration. During this period, the length of which is positively correlated with the complexity of the equipment, the Company

must maintain close surveillance of the performance level of the new equipment. We trust that extraordinary attention will be focused on the recently installed Back Bay ESS equipment and the proposed installation of the Bowdoin ESS. It is only through such close internal monitoring that consumer inconvenience may be kept to a minimal level.

Looking to the future, "4-A" toll switching machines are scheduled for construction in many other localities in the state. In addition, plans are being formulated for the installation of Electronic Toll Switching Machines (ESM) in the late 70's. ESM will have three times the "4-A" capacity (i.e. in the order of 300,000 busy hour "attempts" or calls). ESM construction requires 4-5 years of lead time. A "4-A" machine will come on line in Framingham in April of 1974. Brockton and Worcester will have "4-A" machines operative in 1975.

Some 123 new "toll test" positions were added in 1972. Twelve new "toll test" locations were also added in 1972. In 1973 and 1974, 260 more "toll test" positions and 28 new such locations will be opened in the state.

NET's Vice-President and General Manager for Massachusetts addressed himself generally to a number of plans, organizations and systems, implemented during the past two years to improve the quality of the Company's service. As indicated in the ADL report 70% of the Company's operations are in Massachusetts, where it served 2,100,000 customers and where 3,700,000 phones are in service. He expressed the opinion "that telephone service in Massachusetts, is at satisfactory levels and improving substantially throughout the state". He maintained that this was true from the standpoint of forecasting, design, installation and maintenance practices. We disagree with this contention.

The purpose of his testimony was to highlight the present status of service as of February 22, 1973, and to draw attention to what, in his judgment, could be expected in the future. Much of his testimony reviewed the testimony of the other NET officials and that of the ADL consultants who had previously testified. Before reviewing the nine action directives of the Proposed Service Order, NET's General Manager for the state made the following statement:

> "Based on the findings on service trends in the Arthur D. Little report, the ongoing plans and programs that Arthur D. Little recognized and commenced and the current service trends which are better than those existing at the time that the A. D. Little completed their study, we feel that D.P.U. Order 17490 is not necessary to achieve and sustain good telephone service in Massachusetts. We believe, further, that the Proposed Order as written would interfere with our ability to manage the huge and complex telecommunications network in Massachusetts."

He then recommended that NET and Department officials meet on a quarterly basis. He expressed the view that discussions relative to the Company's Administrative Forecast, and the reasons behind them, as well as any proposed policy changes in forecasting methods could take place during these meetings.

While Company officials expressed serious doubts about the usefulness and implementation of the Proposed Service Order, it should be clearly emphasized that this opposition was aimed at matters of form rather than substance. For example, it was maintained that the proposed form of "exception reporting" would not achieve its originally designated purpose: viz. the creation of a "distant early warning" monitoring system. Company

officers expressed a preference for percentage reporting as opposed to index reporting on the ground that percentage reporting would be more meaningful to the Department and its staff.

A percentage reporting system, in contrast to an exception reporting system, would provide the additional statistical data needed to identify customer affecting trends in quality of service available to the public. Percentage reporting would further enable the Department to identify a central office that may be trending away from an adequate service level.

GENERAL OBSERVATIONS

It is very unfortunate for this Commission to conclude that the service improvements which have been attained, would very likely not have been achieved as quickly as they have but for our extensive state-wide hearings. Since the start of the investigation, Company maintenance practices have been substantially expanded. Electronic Switching System (ESS) central office equipment has been installed in numerous cities and towns.

There is evidence in the record to substantiate the conclusion that the Company had knowledge of a great number of capacity and maintenance problems, which were identified in the ADL Report. It is likewise very clear to us that the scope and intensity of our investigation produced what might even be characterized as a profound shock effect on NET officials. The consumers in the Commonwealth thus benefited from the atmosphere of urgency which we created. When confronted with the broad scope of our investigation, and the intensity of consumer concern, as evoked during the course of some of the hearings, Company officials clearly made what may well have been their most important policy decision of the past twenty years.

NET accelerated what was an obviously deficient construction program, and generally upgraded their maintenance and installation practices. To this end NET not only authorized a massive infusion of capital for central office plant improvement, but since 1969 the Company has increased its number of employees in the Switching System Department by about 30%, or from 1900 to approximately 2500. Similarly, Company employees in Central Office Work Forces have been exposed to a pronounced increase in training hours: From 66,000 hours in 1969 to 200,000 hours in 1972, with over 200,000 hours programmed for 1973.

In general the consumer complaints voiced during our hearings fell within specific categories. We will not undertake to enumerate these complaints in detail, but will cite representative service problems.

Many residential and business users complained of an inability to obtain a dial tone. Some referred to instances when a dial tone was unobtainable for minutes. A dial tone delay of this length is far in excess of the Company's "three second" objective. Others complained of properly dialed calls being effectively "blocked", and that no connection or ring would follow.

Businessmen and members of professions repeatedly complained of overloaded trunk lines, an inability to reach an operator for prolonged periods, and that calls would suddenly be cut off for reasons not due to either party to the conversation. Some spoke of the poor quality of voice transmission. Voices or static would impair their conversations. Other subscribers were unable to obtain repair service when needed. On certain occasions repair service appointments were repeatedly not met for Company reasons. Residential and business service installations were often unfulfilled on given due dates specified by NET.

Subscribers spoke of instances when friends or customers would inform them, personally or in writing, that a properly dialed call to their home or business would be connected to a recording. The latter would erroneously recite that the number in question was no longer in service. In certain cases, parents with seriously ill family members would be unexpectedly faced with a defective telephone in a time of crisis. Other consumers made reference to repeated unsatisfactory Company employee responses to valid requests. It is alleged that repair service or business office personnel would convey an indifferent attitude to consumer complaints.

The record of these proceedings contains a number of justified complaints from residential and business users who were motivated by well founded feelings of frustration, anger, and helplessness.

It is our avowed goal, consistent with the statutory and judicial limitations that limit our authority, to assure the Commonwealth's telephone customers that they will receive the highest quality telephone service that a public utility can possibly offer. This was our declared policy at the time when we initiated this investigation, and it remains our objective.

We are not unmindful of the line of demarcation that exists between the respective domains of regulation and management. Company counsel has ably emphasized, by brief and orally, the importance of the scope of the managerial function. The Supreme Judicial Court has recently addressed itself in unequivocal language to the limitations imposed upon the Department by statute, and the prerogatives that remain those of management. In New England Tel. & Tel. Co. v. Department of Public Utilities No. 7333 Mass. S.J.C., (June 24, 1970), citing New England Tel. & Tel. Co. v. Department of Public Utilities, 331 Mass. 604 (1954), the Court stated:

> "Orders should be so framed as to avoid any attempt to invade the proper scope of the managerial function of the Company's officers ... or interference with the Company's internal operations of a type which has been criticized on other occasions."

This Commission must, and will, follow the Supreme Judicial Court's mandate. We will respect the Company's right to formulate internal policies and manage its own business. We have neither a statutory right nor warrant to transcend the parameters that separate regulatory and managerial functions. However, we do have statutory authority to insure that telephone and other utility customers receive service that is "just, reasonable, safe, adequate and proper" G.L. Chapter 159, Section 16. It was under this statutory authority that we began this investigation.

NET officials would be well advised to remember the conditions that precipitated this investigation, for we shall not refrain from initiating further swift formal inquiry into the adequacy of telephone service should certain adverse trends begin to appear in the Company reports of performance indices. We will be particularly attentive to the central office construction "on line" objectives for 1973, especially regarding the Bowdoin ESS installation, scheduled for completion on August 26, 1973. As previously noted the new Kendall Square "4A" tandem facility became operative on June 2, 1973, and the Back Bay ESS central office addition also became operative on this same date. It is our intention to carefully review the performance reports for the Cities of Newton, Brookline and Cambridge, as well as the Metropolitan Boston Area in general.

We very much regret that a deterioration in adequacy of service of substantial magnitude, of which the Company had knowledge, had to transpire before management adopted appropriate remedial action. NET seemed embedded in a quandary. Much valuable time was lost before it finally took affirmative steps to effectively apply itself to resolve its many problems. It is indeed ironic that a utility which provides a communication service suffered from profound problems of internal corporate communication. That the Company experienced serious internal managerial problems in the period 1968 to late 1971 is clear from this Department's complaint records. We stand convinced that a number of old internal company policies were, in the end, detrimental to telephone users. Many of these policies have now been abrogated or modified. In given circumstances, the absence of specific policies contributed in large measure to the creation of barriers that ultimately impeded NET from providing adequate and reliable service to the public.

These internal corporate problems assuredly did not constitute a recommended model of modern day business management techniques.

We have been urged to penalize the Company for having provided inadequate and unreliable service in certain communities. The vast majority of these cities and towns are located within the greater Boston area. Counsel for the City of Newton has advanced this very argument. The gravamen of this contention, predicated upon a credit for past or future inadequate service theory, pressuposes that this Department is vested with the statutory power to order such credits. It is argued that the Department can base such an order upon the provisions of G. L., Chapter 159, Sections 12, 13, 14, 17 and 24. The argument is further advanced that the Department can order rebates by using its general regulatory powers. We disagree.

We have long ago concluded that certain omissions in the public utilities laws of the Commonwealth contribute to the creation of a relationship that favors NET. This is patently unfair to the consumer. It was indeed to cure this glaring omission that this Department introduced H. 205 (1973) to provide us with the power to order rebates in the form of credits for past improper or inadequate service. We are informed that the House of Representatives has seen fit to substitute House 1911 in lieu of our original proposal. House 1911 would permit the Department to order rebates or refunds in the form of credits to customers of telephone companies rendering unsafe, improper or inadequate service. It has received a favorable report and was referred to the Committee on Ways and Means on April 24, 1973. We are hopeful that it will become law.

Assuming its enactment into law, we will not hesitate to use it in the future, with proper restraint, to protect the consumer. This we would do only when its usage would be warranted by the evidence. The passage of this Bill would create a very effective regulatory mechanism. If vested with such additional authority, we are of the view that its mere existence would provide the requisite impetus to move any telephone company into preemptive curative action when service trends reveal serious inadequacies, actual or imminent. It is our belief that the need for the actual use of this proposed statutury power would, in all likelihood, prove to be very rare.

We trust that the many new programs, periodic meetings, statistical studies and committees which the Company now uses within its own organization will continue to yield beneficial service results. These are aimed at focusing attention and manpower on actual or potential engineering and service problems. They have brought about many salutary results that have come to our attention since the initiation of the Arthur D. Little study. NET past performance has revealed the ADL study to have been entirely justified. In fact, the ADL analysis and report to this Commission, along with the proposed order, can justifiably be said to have produced a "dividend" in improved service that far outweighed its cost. When viewed in this light, we consider the ADL Technical Analysis and Report to have been a most valuable investment which inured to the benefit of the consumer.

In the final analysis, the Company realized full well that our consultants possessed the technological expertise to sound the depths of NET's complex organization and electronic equipment. ADL understood the Company's engineering problems. Our consultants recognized overloaded equipment conditions, and they also displayed a comprehension of the most

modern telecommunications equipment - and reported their findings accordingly. When thus faced with this fact, the Company chose what was, at this juncture, their only option: To employ additional employees, and redeploy other personnel and implement new policies, to rectify a deteriorating situation as quickly as was humanly and technically possible. We cannot commend the Company for its past derelictions, the existence of which are either greatly minimized or denied by NET. There was a protracted period of time when NET performance fell below Bell System Standards in numerous categories. We deplore these past reprehensible management errors.

The evidence adduced during the last two days of hearings (Feb. 21 and 22, 1973), compels us, as the trier of fact, to conclude that substantial evidence has been presented to warrant a finding that the present quality of service has been significantly improved.

With certain exceptions, while not yet completely adequate, service appears to be improving significantly in most districts within the Commonwealth. Major exceptions to this improving trend are the continuing presence of "overflow weak spots" in two very important Boston Central offices: (1) The Bowdoin, and (2) the Back Bay central offices.

Procedural Matters

By letter dated October 26, 1972 Company counsel reserved any rights which might, after the end of the hearing, be recognized to have arisen to NET's benefit under Section 7.2 of the Department's Rules of Practice. In keeping with the tenor of its letter, on March 9, 1973 the Company filed a "Motion for Compliance with Rule 7.2". This rule provides that in the event that a majority of the Commission has neither heard nor read the evidence in a proceeding, and that if a decision proves adverse to a party that has reserved its rights under the rule, then, such decision shall be made only after a "tentative or proposed" decision is delivered or mailed to that party. Since a majority of the Commission has heard and read the evidence adduced herein, the issue raised by this motion is now moot.

On March 9, 1973 the Company filed a "Motion to Dismiss Proceeding" on the ground that there is no basis in law or fact for a finding by the Department, pursuant to Chapter 159, Section 16, that the regulations, practices, equipment, appliances or service of NET are unjust, unreasonable, unsafe, improper or inadequate. This motion is denied.

On March 9, 1973 the Company also filed a "Motion to Strike Exhibits". The Company moves that Exhibits 10, 11, 12, and 13 which were admitted de bene at the Newton phase of the hearing be stricken on the ground that they do not relate to the subject matter of this proceeding. This motion is denied.

During the course of the hearings held in the City of Newton, counsel for the Mayor and the City of Newton filed a "Motion to Amend Proposed Service Order". This motion is framed in two parts. It first seeks the adoption of the Department's proposed service order. Secondly, it requests that the proposed service order be amended to include an "index system plan" similar in form to one that has been adopted in the State of New York. This

motion is denied in respect to both requests.

Counsel for the City of Newton orally requested that the Department order rebates or credits for past poor service. The record is unclear whether this request was, from a strict procedural standpoint, intended to be a motion. In the event that it might have been so intended, this motion is denied, for the reasons which we have previously delineated.

Requests for Rulings

Counsel for the Mayor and City of Newton filed 10 requests for rulings. Requests 1, 2, 4 and 10 are granted. Requests 3, 5, 6, 7, 8 and 9 are denied.

Counsel for the Company filed 33 requests for rulings. Requests 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 13, 20, 24, 25, 27, 28, 29 and 32 are granted. Requests 8, 14, 15, 16, 17, 18, 19, 21, 22, 23, 26, 30, 31 and 33 are denied.

CONCLUSION

The language of public utility regulation has historically made use of a terminology founded in the specialized fields of law, accounting, engineering, mathematics, finance and business. The very complexity of the art renders much of utilities regulation, including telephone regulation, easily susceptible of misunderstanding by the consuming public. The telephone has become a necessity of modern life. Its very nature causes it to assume a personal dimension. Innumerable facets of telephone construction, maintenance and engineering, however, do not lend themselves easily to explanation. Hence the need for expert consultants. It is perhaps unfortunate, but nonetheless true, that the reports which such specialists may submit are themselves not easily expressed in everyday language. As a general proposition, the telephone user is interested in one overriding question when he or she wishes to use a telephone:

Will it function as it should?

The telephone consumer is, in all probability, not interested in knowing why his or her phone may be malfunctioning. The user simply wants the instrument to function properly when it is needed. This expectation is not altogether unreasonable. Indeed, this Department shares this expectation.

We can well understand that the public may not be at all interested in the dozens of Company committees, indices of performance, specialized testing procedures, programs, plans, meetings - all elaborately organized and described by a panoply of acronyms and code names. These matters are of great interest to the Company. They are also of equal interest to this Department. For it is only after careful study and analysis of these specialized matters, such as the components of the Dial Line Index, that appropriate conclusions may be drawn - and

specifically indentifiable corrective measures ordered.

Absent a clearly stated statutory power to impose monetary sanctions for the Company's past poor performance, particularly in the period between late 1968 through 1972, we reluctantly must focus our attention on the present and the future. We are doing this now. We reassure the telephone users of the Commonwealth that this Department's regulation of NET will continue unabated.

The Company has, as its last request for rulings (i.e. No. 33), requested that: "Upon all of the evidence, it is ruled that this proceeding be, and it hereby is, terminated." This request is denied. These proceedings remain open.

NET has antagonized vast segments of the consuming public during the past four years. The Company can perform in a superior manner in the technological sphere, especially when under the scrutiny of experts. The Company should now strive to regain the respect of its customers. The Company lost much ground in the arena of customer relations during the period 1968-1972. Progressive and enlightened consumer relations can only enure to the benefit of all interested parties. In the end, this will reduce any potential for consumer dissatisfaction. Consumers of telephone service must be treated as persons, not as impersonal statistics on a monthly bill.

We encourage NET to caution all of its employees to comport themselves with courtesy and concern when dealing with their customers. We do not intend to imply by these comments that the Company is generally callous with the public. However, monopoly status can, and often has, engendered arrogance and indifference toward consumers in a captive marketplace. We commend NET for the steps it has taken to measure customer attitudes regarding the quality of its service namely, its

Service Attitude Management (SAM) and its newest TEL SAM surveys, and we will closely study future trends reflected by these studies.

Yet, surveys alone are of little inherent value, if the knowledge of attitudes which they reveal do not evoke a response that is commensurate with the remedial action which they may well often dictate. Any indication of mediocre service habits should be "nipped in the bud". We accordingly urge the Company to continue to implement those employee supervision programs which it presently has in existence. These are aimed at insuring customer satisfaction, and make adequate provision to protect the rights of NET's own employees. We additionally recommend that NET management take appropriate responsive action when circumstances so warrant, not solely by improving its "image" through advertising campaigns, but far more importantly, by very careful supervision of those employees with whom the public has direct contact on a day to day basis. We are of the view that this course of action will, in the final analysis, after a period of diligent effort, convey an attitude of genuine concern for the consumers of telephone service.

We know that the Company, and its parent majority stockholder, American Telephone and Telegraph Company, have within their executive and management ranks, people who possess the leadership qualities required to implement these objectives. We are hopeful, <u>indeed we, expect</u>, that NET will take the requisite steps to maintain a constant effort to improve its relationship with the people whom they serve in the Commonwealth.

There is more than an iota of truth to the expression, much maligned and misunderstood though it may be, that a positive correlation exists between rates and adequacy of service. But we <u>do not</u> unqualifiedly

accept the notion that "rates and service go hand in hand". We believe that this time worn phrase states the precept far too inflexibly, and that it is overly simplistic. Such facile reasoning tends to foster an attitude or policy on the part of management whereby any deficiency in the adequacy of service, whether minor or significant, could be explained away by the response: "The Company needs rate relief". Were we to accept this logic, the Commission would be abdicating its regulatory duties and permitting the Company to function as though under a "cost plus" guaranteed profit contract.

We categorically reject such reasoning as being both ill-founded and patently illusory. Efficiencies of scale and technological advances are possible of achievement. In like manner, this approach attaches insufficient importance to a long established fact of business life - that the management and operation of any business enterprise, including a public utility, can be rendered more efficient by careful attention being constantly addressed to costs and work patterns at the executive and staff levels.

It would seemingly be appropriate at this time for us to emphasize certain fundamental points. Those not knowledgeable of the many subtleties that exist in the regulation of public utilities are often heard to say that a telephone company is "guaranteed" a profit. Others sometimes allege that a Company's stockholders are always "assured of their dividends". There is no greater misconception in utilities regulation than the idea that a utility is "guaranteed" a profit. A utility is certainly entitled, as a matter of law, to a fair rate of return on its net plant investment. But to assert anything beyond this proposition is egregious error, and has explicitly been characterized as an "aberrant myth". See Priest, Principles of Public Utility Regulation Vol. 2 pp. 787-789 (1969).

Upon consideration of all of the evidence and arguments presented at said hearing, the Department is of the opinion that some of the services, equipment and practices of New England Telephone and Telegraph Company, were, and are, inadequate.

It is

ORDERED: That the New England Telephone and Telegraph Company report to the Department according to the schedule set forth below the following information:

Installation Service

% Installation requests not complied with

% Station appointments not met - Company reasons

% Regular orders completed within 5 days

% Special orders completed within 2 weeks

Orders for main telephone service held over 30 days

Regrades of service held over 30 days

Repair Service

Customer Reports per 100 Stations.

Dial Service

% Dial Tone Speed over 3 seconds

% Equipment Irregularities

% Overflows

NOTE: For each of the items listed in the three categories above, data should be furnished for each Division, and certain districts within each Division in the State, which the Department will, from time to time, designate.

DDD Service

% Equipment Blockages & Failures - Incoming

% Equipment Blockages & Failures - Outgoing

(Both to be reported by tandem switching offices)

Operator Services

% Answers over 10 seconds - Toll & Assistance

% Answers over 10 seconds - Directory Assistance

For each of the items in the Installation Service, Repair Service, Dial Service, DDD and Operator Services categories, the percentage data furnished should also be expressed in a manner and form which will indicate whether these percentage data are within Bell System objective standards.

NOTE: For each of the items in the "% Answers over 10 seconds" categories, data should be furnished for the Northeast, Southeast and Western Divisions, for Boston and for the total State. - List of final trunk groups with % No Circuit (N.C.) over 3.1% for three consecutive months.

It is

FURTHER ORDERED: That on or about the twentieth day of January, April, July and October, the New England Telephone and Telegraph Company furnish said information for each of the preceding three months, except that the list of final trunk groups with % No Circuit (N.C.) over 3.1% for three consecutive months be furnished for the three months ending November, February, May and August respectively.

It is

FURTHER ORDERED: That on or about the twentieth day of January, April, July and October, the New England Telephone and Telegraph Company identify in writing to the Department, potential service problems in central offices or final trunk groups and meet thereafter with the Department to discuss said problems as well as the other information furnished as set forth above.

It is

FURTHER ORDERED: That the New England Telephone and Telegraph Company advise the Department when it has developed a "Trunk Orders Unfulfilled"

system to monitor the provision of trunk plant from the request stage through the connect stage, and further advise the Department monthly of the progress of the TELSAM study, and provide the Department with copies of the TELSAM questionnaire within 14 days of the date of its completion.

It is

FURTHER ORDERED: That the New England Telephone and Telegraph Company advise the Department if and when any three-year forecast for main service exceeds the planned outside plant capacity for any central office.

It is

FURTHER ORDERED: That New England Telephone and Telegraph Company advise the Department if and when it plans the introduction by tariff filing of a service offering which will cause a deterioration of basic telephone service.

It is

FURTHER ORDERED: That the New England Telephone and Telegraph Company submit to the Department an annual report on its construction budget in the form introduced during these proceedings.

It is

FURTHER ORDERED: That New England Telephone and Telegraph Company continue the use of its customer service attitude management questionnaire, known as SAM, until such time when it may be replaced by a newer survey of customer satisfaction known as TELSAM.

It is

FURTHER ORDERED: That New England Telephone and Telegraph Company provide the Department with bi-weekly progress reports regarding the installation of Electronic Switching System (ESS), and related trunk rearrangements or additions in the Bowdoin central office.

It is

FURTHER ORDERED: That New England Telephone and Telegraph Company provide the Department with monthly progress reports regarding the construction and installation of "4A" tandem facilities, and related trunk construction in the communities of Lawrence, Framingham, Brockton and Worcester.

It is

FURTHER ORDERED: That any part of this Order may be amended at any time pursuant to agreement between the Department and the New England Telephone and Telegraph Company.

It is

FURTHER ORDERED: That these proceedings remain open, pending further Order during the continuing surveillance by the Department of the matters contained herein.

By Order of the Department,

/s/ FRANCIS J. HICKEY, JR.

Francis J. Hickey, Jr.
Secretary

A true copy
Attest:

Secretary

Appeal as to matters of law from any final decision, order or ruling of the Commission may be taken to the Supreme Judicial Court by an aggrieved party in interest by the filing of a written petition praying that the order of the Commission be modified or set aside in whole or in part.

Such petition for appeal shall be filed with the Secretary of the Commission within twenty days after the date of service of the decision, order or ruling of the Commission, or within such further time as the Commission may allow upon request filed prior to the expiration of the twenty days after the date of service of said decision, order or ruling. (Sec. 5, Chapter 25, G. L., Ter. Ed. as most recently amended by Chapter 485 of the Acts of 1971)